

Remarks

Withdrawn Claims

Withdrawn claims 63-66 have been canceled from the present application and are being filed in a separate divisional application.

Rejections Under 35 USC §102 and 35 USC §103

Claims 52-54, 60-62, 71-74, 76 and 77 have been rejected under 35 USC §102(b) as being anticipated by Farnworth et al. (US Patent No. 6,093,933).

Claims 56-59 and 70 have been rejected under 35 USC §102(b) as being anticipated by Dasse et al. '273 (US Patent No. 5,594,273).

Claim 55 has been rejected under 35 USC §103(a) as being unpatentable over Farnworth et al. (US Patent No. 6,093,933) in view of Dasse et al. '273 (US Patent No. 5,594,273).

Claim 75 has been rejected under 35 USC §103(a) as being unpatentable over Farnworth et al. (US Patent No. 6,093,933) in view of Farnworth (US Patent No. 5,851,911).

The rejections under 35 USC §102 and 35 USC §103 are traversed for the reasons to follow.

35 USC §102 Rejections Of Claims 52-54, 60-62, 71-74, 76 and 77 Over Farnworth et al.

As previously argued, the present component includes a substrate 10 having a plurality of components 12. In addition each component 12 includes a separate pattern of conductors (22-Figure 2F) configured to perform the dual function of redistributing component contacts (28-Figure

4), and of either repairing, reconfiguring, or electrically isolating defective components (12D-Figure 4).

Independent claims 52, 60 and 70 have been amended to include recitations that emphasize the structure and function of the conductors, and further distinguish the invention from the prior art. In addition, the rejected dependent claims have been amended to be consistent with the amended independent claims. Rejected dependent claims 71-77 have also been amended to depend on independent claim 70 rather than 60.

Independent claims 52, 60 and 70 have been amended to state the metal layer comprises "a plurality of separate patterns of conductors on the components in electrical communication with the component contacts configured to redistribute the component contacts on each component". Antecedent basis for the "pattern" recitation, and for the "each component" recitation, is contained on page 5, lines 6-7 of the specification. These recitations are intended to clarify the redistribution function of the conductors, as each component includes a pattern of conductors.

In support of the 35 USC §102 rejections over Farnworth et al., the conductive paths 32 (Figure 3) were cited as being equivalent to the presently claimed conductors. However, the conductive paths 32 (Figure 4) and auxiliary components 30 (Figure 4) are formed in the wafer street area (column 2, lines 40-41). As such, each component in Farnworth et al. (die 12-Figure 4) does not include a separate pattern of conductors configured to redistribute the component contacts.

Amended independent claim 52 also recites that the components include at least one "defective component identified during a component testing process". Antecedent

basis for the "testing" recitation is contained on page 4, lines 23-24, and on page 7, lines 24-26 of the specification. Amended independent claim 52 also recites "the separate patterns of conductors containing information from the component testing process for repairing the defective component." Antecedent basis for this recitation is contained on page 13, lines 27-32 of the specification.

The separate patterns of conductors are thus defined as including information from the testing process incorporated into the layout of the conductors. This information is incorporated into the conductors during a laser patterning process. However, the incorporated information is an actual physical characteristic rather a method of making the conductors. In addition, each component includes a pattern of conductors containing information for "connecting selected component contacts on the defective component with selected integrated circuits on the defective component".

Further, there is no teaching in Farnworth et al. that the defective component is repaired by connection of selected component contacts on the defective component with selected integrated circuits on the defective component. In Farnworth et al., the dies 12 are tested (column 3, lines 8-10), and fusible links 24 are blown (or anti-fusible links 36 are joined) to isolate the connection between the defective component (dies 12) and PLAs 30 (column 3, lines 9-15). The PLAs 30 in Farnworth et al. are not on the defective dies 12 as in the present component, but are in the streets of the wafer 10. Further, the fusible links 24 (or anti-fusible links 36) are separate additional elements which are not required by the present component.

Amended independent claim 60 states that the separate patterns of conductors are configured to "reconfigure the component contacts on the defective component. Claim 60 also states "the separate patterns of conductors containing information from the component testing process for reconfiguring the component contacts on the defective component." As argued above there is no teaching in Farnworth et al. of reconfiguring component contacts on defective components using separate patterns of redistribution conductors containing testing information.

In view of the additional recitations, and the fundamental differences between amended independent claims 52 and 60, and Farnworth et al., the 35 USC §102 over Farnworth et al. are submitted to have been overcome.

35 USC §102 Rejections Of Claims 56-59 and 70 Over Dasse et al. '273

Amended independent claim 56 states that the separate patterns of conductors are configured "to electrically isolate the defective component on the substrate during burn-in testing of the good components". In addition, amended claim 56 states "the separate patterns of conductors containing information from the component testing process for electrically isolating the defective component."

As argued with respect to Farnworth et al., Dasse et al. '273 does not teach or suggest separate patterns of conductors, which perform both a redistribution function and an electrical isolation function. In addition, Dasse et al. '273 does not teach or suggest conductors which contain information from a testing step.

In Dasse et al. '273 the conductors (wafer wide busses 42-47-Figure 2) are used to perform burn in testing (column

3, lines 64-66). However, the conductors (wafer wide busses 42-47-Figure 2) are not separate patterns of conductors on the dice 22 configured to perform a redistribution function as presently claimed. In addition, rather than containing information from a testing process for isolating defective components, as with the present conductors, resistors 77 (Figure 4) are configured to "limit current flow" (column 11, lines 39-41).

It is submitted that "current limiting" using a resistor as in Dasse et al. '273 is not the same as "electrical isolation of defective components" using conductors containing "testing information" as in the present claims. Further, as with the fuses and anti fuses of Farnworth et al., the resistors in Dasse et al. '273 are additional elements which add to the expense and complexity of the components. In supporting the rejections over Dasse et al. '273, the Examiner has characterized the resistors in Dasse et al. '273 as being isolating devices. However, this characterization is incorrect. Switches are isolating devices, resistors are current limiting devices.

As with claim 56, amended independent claim 70 also recites "separate patterns of conductors on each component". Amended independent claim 70 also recites that the conductors contain "information from the component testing process for connecting the multiple components and excluding the defective component." In Dasse et al. '273 there is no clustering of good components using conductors containing information from a testing process. Rather, clustering of subgroup 514 in Figure 14 of Dasse et al. '273 is performed using photolithography (column 23, lines 13-14), but without testing information that excludes defective dice from the cluster. The clustering in Dasse

et al. '273 is a function of geometry rather than testing, and is performed using photopatterning rather than conductors containing testing information.

35 USC §103 Rejection Of Claim 55 Over Farnworth et al. and Dasse et al. '273

Dependent claim 55 states "the conductors are configured to electrically connect multiple components in a cluster that excludes the second defective component". As argued above, the combination of Farnworth et al. and Dasse et al. '273 does not teach clustering of multiple components on a substrate, performed using separate patterns of conductors containing testing information.

35 USC §103 Rejection Of Claim 75 Over Farnworth et al. and Farnworth

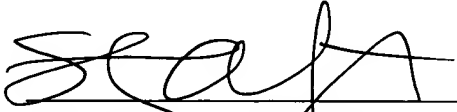
Dependent claim 75 recites "a protective layer on the conductors having a plurality of openings for the terminal contacts". Although protective layers are known in the art, this feature is submitted to be patentable in combination with the previously identified novel and unobvious features of claim 70 (e.g., separate patterns of conductors containing testing information configured to perform both redistribution and clustering of good components).

Conclusion

In view of the amendments and arguments, favorable consideration and allowance of claims 52-62 and 70-77 is respectfully requested. Should any issues arise that will advance this case to allowance, the Examiner is asked to contact the undersigned by telephone.

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